View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by University of Kentucky

University of Kentucky
UKnowledge

Theses and Dissertations--Early Childhood, Special Education, and Rehabilitation Counseling

Early Childhood, Special Education, and Rehabilitation Counseling

2017

Visual Activity Schedules with Embedded Video Models to Teach Laundry Skills to Adults with Intellectual Disability

Charity G. Watson
University of Kentucky, cwatson2055@gmail.com
Digital Object Identifier: https://doi.org/10.13023/ETD.2017.192

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Recommended Citation

Watson, Charity G., "Visual Activity Schedules with Embedded Video Models to Teach Laundry Skills to Adults with Intellectual Disability" (2017). *Theses and Dissertations--Early Childhood, Special Education, and Rehabilitation Counseling*. 41.
https://uknowledge.uky.edu/edsrc_etds/41

This Master's Thesis is brought to you for free and open access by the Early Childhood, Special Education, and Rehabilitation Counseling at UKnowledge. It has been accepted for inclusion in Theses and Dissertations--Early Childhood, Special Education, and Rehabilitation Counseling by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

STUDENT AGREEMENT:

I represent that my thesis or dissertation and abstract are my original work. Proper attribution has been given to all outside sources. I understand that I am solely responsible for obtaining any needed copyright permissions. I have obtained needed written permission statement(s) from the owner(s) of each third-party copyrighted matter to be included in my work, allowing electronic distribution (if such use is not permitted by the fair use doctrine) which will be submitted to UKnowledge as Additional File.

I hereby grant to The University of Kentucky and its agents the irrevocable, non-exclusive, and royalty-free license to archive and make accessible my work in whole or in part in all forms of media, now or hereafter known. I agree that the document mentioned above may be made available immediately for worldwide access unless an embargo applies.

I retain all other ownership rights to the copyright of my work. I also retain the right to use in future works (such as articles or books) all or part of my work. I understand that I am free to register the copyright to my work.

REVIEW, APPROVAL AND ACCEPTANCE

The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Director of Graduate Studies (DGS), on behalf of the program; we verify that this is the final, approved version of the student's thesis including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Charity G. Watson, Student

Dr. Sally B. Shepley, Major Professor

Dr. Ralph Crystal, Director of Graduate Studies

Visual Activity Schedules with Embedded Video Models to Teach Laundry Skills to Adults with Intellectual Disability

---

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Education
at the University of Kentucky

By

Charity G. Watson

Lexington, Kentucky

Co-Directors: Dr. Sally Shepley, Professor of Special Education
and Dr. Amy Spriggs, Professor of Special Education

Lexington, Kentucky

2017

Copyright© Charity G. Watson

ABSTRACT OF THESIS

Visual Activity Schedules with Embedded Video Models to Teach Laundry Skills to Adults with Intellectual Disability

Research using visual activity schedules (VAS) with embedded video models (VM) has been effective to teach novel skills to children and adolescents with intellectual disability (ID). However, there is limited research using VAS/VM to teach adults with ID. The purpose of the current study was to determine if VAS/VM could be used as a self-instructional tool for adults with ID to increase independence in laundry skills. Results from the current study provide evidence that a functional relation exists when using VAS/VM to teach laundry skills to adults with ID. Two adults generalized the use of the VAS/VM to a novel setting with similar tasks.

KEYWORDS: Intellectual disability, visual activity schedule, video modeling

Charity G. Watson

April 19, 2017

VISUAL ACIVITY SCHEDULES WITH EMBEDDED VIDEO MODELS TO TEACH LAUNDRY SKILLS TO ADULTS WITH INTELLECTUAL DISABILITY

By

Charity G. Watson

Dr. Sally Shepley
Co-Director of Thesis

Dr. Amy Spriggs
Co-Director of Thesis

Dr. Ralph Crystal
Director of Graduate Studies

4/19/17

TABLE OF CONTENTS

LIST OF FIGURES

Section 1: Introduction

There are numerous studies published with adolescents and adults with moderate to severe intellectual disability (ID) learning self-care, self-management, increased independence, and daily living skills (e.g., Bereznak, Ayres, & Mechling, 2012; Mechling, Ayres, Bryant, & Foster, 2014; Mechling & Collins, 2012). When taught independence, individuals with ID may achieve maximum levels of success within the classroom and community (Bryan & Gast, 2000). Independence enhances not only the individual's quality of life but also their caregiver's by decreasing stress (Chan & Sigafoos, Watego, & Potter, 2001; Landesman & Butterfield, 1987). Independence is achieved through the various supports from parents/guardians, teachers, therapists, and other professionals that help the individual to acquire and maintain learned skills. There are many effective interventions to help fade constant support from caregivers and other professionals. These interventions increase independence and the learned behaviors can generalize to other environments (Smith, Ayres, Alexander, Ledford, Shepley, & Shepley, 2015; Tabor-Doughty, Miller, Shurr, & Wiles, 2013).

One strategy that has been proven to be effective when teaching learners with ID is visual activity schedules (VAS). VAS are a visual support strategy that uses photographs, drawings, or written text arranged in sequential order for the learner to follow. VAS can vary in form (e.g., words, pictures, line drawings, objects) and location (e.g., wall, computer, electronic device, folder, desk) according to the individual's needs (Banda & Grimmet, 2008). VAS have been used to teach individuals with ID many skills such as the use of an iPad during a leisure activity (Chan, Lambdin, Graham, Fragale, & Davis, 2014), dishwashing (Gardner & Wolfe, 2015), and to complete a sequence of tasks

(Duttlinger, Ayres, Bevill-Davis, & Douglas, 2012). VAS are static and can be portable, allowing a consistent example that can be transferred within and between activities. VAS have been used to not only teach simple actions but also complex behavior chains. Another benefit of VAS is that they can allow complex behavior chains to be broken down into sequential smaller tasks (i.e., steps).

Video modeling (VM) is another strategy that can be used to teach these complex chained tasks. VM allows a learner to view a consistent demonstration of a task from start to finish. VM is an effective intervention used to teach functional, social, and communication skills to individuals with ID (Mechling, 2005). VM involves watching a video of a target skill then imitating the behavior shown in the video. The use of VM allows a decrease in the amount of prompting from caregivers and other professionals. There are many benefits for using VM as a prompting tool for individuals with ID. An individual views a consistent model as many times as necessary to complete the skill. Additionally, video models are easily available in a variety of settings (e.g., home, school, work, community). Last, VM is a cost-effective method of teaching when compared to *in vivo* modeling (Mechling, 2005). Additional supports (e.g., therapists) can range in cost and vary depending on the time. Purchasing a device one time to play VM limits the cost of requiring additional supports. VM is an effective prompting tool that is readily available and cost effective.

VAS and VM are both evidence based practices used to teach a variety of skills (Spriggs, Mims, van Dijk & Knight, 2016; Bellini & Akulian, 2007). VAS can be created and transferred across environments easily. The use of VM is becoming more available with the advances in technology. VAS and VM are readily available through various devices including portable iPods and computers (Mechling, 2005). These technologies are discrete and age-appropriate (Spriggs, Knight, & Sherrow, 2015). It is socially appropriate to bring and use technology in almost every setting, as peers without disabilities often use technology for calendars, planners, and other forms of support.

Establishing the use of VAS and VM independently of one another are effective strategies. Spriggs et al. (2015) expanded this research by using VAS in conjunction with VM by examining the use of VAS with embedded VM (VAS/VM). The study used VAS/VM to increase acquisition of novel skills as well as independent transitioning from one skill to the next. Four high school adolescent students diagnosed with autism spectrum disorder (ASD) and ID participated in this study, which took place in a self-contained classroom. The researchers used a system of least prompts procedure to teach the participants to use an iPad application called "*My Pictures Talk*." This application presented a VAS consisting of images that played VM once activated. This study demonstrated that VAS/VM could be an effective instructional method for teaching adolescents with ASD and ID to self-instruct and complete tasks independently.

There is limited research on teaching the adult population of individuals with ID. These individuals often require full-time care from their caregivers. Learning daily living skills and independence can improve the quality of life of the individual and their caregivers. VAS and VM have been shown to be effective interventions for children and adolescents with ID (Spriggs et al. 2015). Spriggs et al. (2015) demonstrated that VAS/VM could be an effective intervention for adolescents with ASD. Replicating Spriggs et al., this study will extend the research of VAS/VM to self-instruct novel skills for adults with ID. The purpose of the current study was to answer two questions. First, is there a functional relation between using VAS with embedded VM and increased independence in laundry skills in adults with ID? Second, if there is a functional relation, will the skills generalize to a novel setting?

Section 2: Method

Participants

This study included four participants (two males, two females) ages 31-53 years old. All participants attended a privately owned adult day program located in an rural city in the southeastern U.S. Diagnoses were in line with what might be diagnosed as ID today, but do to their age scores relayed to cognitive ability and adaptive functioning were not available. Participants had adequate vision (i.e., able to discriminate between pictures and attend to videos by orienting their eyes toward the video for a minimum of 30 s) and were physically able to transition between activities (e.g., independently move from one room to another). All participants were able to imitate a VM (see Screening section below). They possessed the ability to learn fine/gross motor skills necessary to complete the target activities (i.e., laundry skills).

Ronnie was a 37-year-old Caucasian male diagnosed with severe ID, Cerebral Palsy, hypertension, diverticulitis, incontinence, hyper sensitivity of extremities and arthritis agitation. He had attended the day program for 14 years. Ronnie had strong receptive communication skills and followed multiple step instructions. Ronnie's IQ and adaptive behavior scores were not available. Ronnie received a certificate of completion from a public school system in 2001. Prior to the study, Ronnie engaged in activities on the computer with limited access to a smart phone or tablet. Ronnie engaged in cleaning his room, setting the table, and putting away clean dishes when prompted by his parent. Prior to intervention, Ronnie brought his laundry to the laundry area of his home.

Kathy was a 44-year-old female diagnosed with Down syndrome. She had attended the day facility for 14 years. Kathy received a certificate of completion from a public high school in 1994. Others could clearly and easily understand Kathy's speech. She could follow multiple step instructions and complete small tasks (e.g., writing a menu on the board, passing out materials). Kathy worked part time (2 hours per week) at a local business as a greeter. Before beginning this study, Kathy engaged in recreational activities (e.g., watching movies) on a personal tablet. Kathy participated in daily living skills (e.g., cleaning the table after a meal, cleaning her room, making her bed, sweeping, vacuuming) in her home. When prompted by her parents, Kathy participated in additional daily living skills up to three steps (e.g., food preparation, organizing materials). Kathy did have some prior knowledge of doing the laundry. When prompted by her parents, Kathy could bring dirty laundry to the laundry room, transfer laundry from the washing machine to the dryer, and remove laundry from the dryer.

Dean was a 53-year-old male diagnosed with Down syndrome and diabetes. He had attended the day program for 14 years. Dean had slurred speech and often combined words together. Dean had no formal education but could follow multi-step instructions. Prior to intervention, Dean did not have any experience with a smart phone or tablet technology. Dean did not engage in daily living skills prior to intervention. Dean had no known previous history with doing the laundry.

Anna was a 31-year-old female diagnosed with mild mental retardation and Arthropathy Not Otherwise Specified Multiple Sites (NOS-MULT). She received a certificate of completion from a public school system in 2007 and had attended the day facility for 10 years. Anna's expressive language consisted of slurred speech with a lack of articulation of syllables within words. Anna could follow multiple step verbal commands. Prior to intervention, Anna engaged in recreational activities (e.g., taking pictures, playing games) on a smart phone, but has limited experience with tablet technologies. Anna participated in daily living skills with additional prompting from her parents. Anna cleaned her room, put dishes into the dish washing machine, vacuumed her house, and completed small tasks when prompted by her parents. Prior to this study, Anna gathered her dirty laundry, brought the basket of dirty laundry to the laundry room, loaded previously sorted dirty laundry into the washing machine, and put clean laundry into a basket from the dryer.

The researcher who conducted this study was a master's student studying applied behavior analysis. The researcher implemented the session procedures and collected intervention data. Staff included the program manager employed by the adult day care facility. The staff member was an employee for over 15 years and had good attendance records. The staff member completed training in data collection procedures, including reliability and fidelity data. Data collection training sessions included an adult with ID not participating in the study completing the laundry task analyses. When prompted to do the laundry, the adult not participating in the study completed known steps of the laundry task. The staff member and researcher collected data. This served as training sessions for inter-observer agreement (IOA) and procedural fidelity (PF).

Screening

Screening occurred for all participants including task completion of target tasks, the ability to imitate video models, and the ability to self-instruct using VAS/VM. A screening of laundry tasks evaluated if the participants knew how to do the laundry. Task completion of laundry tasks consisted of sorting, washing, and drying clothes. The researcher took the participant to the laundry area and said, "It's time to do the laundry." The participants were given 5 s to initiate the task. The participants had 30 s to complete each step. Each participant was allotted 3 min to complete each laundry task (i.e., drying, sorting, and washing laundry; see Table 1), with 9 min to complete the total laundry task. If a participant completed 50% or more of the laundry task independently, they were excluded from the study. If a critical error or no response occurred for 30 s, the researcher ended the screening session. Completion of critical components allowed steps to be out of order as long as critical components occurred (e.g., putting dirty laundry into the washing machine and putting the detergent into the washing machine prior to closing the washing machine door and starting the machine). To assess if the participants could imitate a VM, the researcher filmed a video of an arbitrary task (i.e., stacking cups in a specific order). Participants were given an opportunity to imitate the simple video model. To be included in this study, participants had to attend to the video and imitate the VM with 80% or higher task completion. An assessment for screening the navigation of technology for each participant was assessed. Participants had access to an iPad and were told to "check their schedule". If no response or an incorrect response occurred, the session ended Performance during screening indicated if a participant did or did not need the technology training condition. For example, if the participant could complete 100% of the navigation steps, they did not need to complete technology training. Anything less than 100% performance, indicated that the participant needed systematic instruction to learn to navigate the iPads... Each participant met the screening criteria to remain in the study.

Setting

This study took place at an adult day care facility that contained a laundry area consisting of a washing machine, dryer, necessary cleaning supplies, and storage of materials. This area was located in a corner of a large open room where 15-25 clients were located participating in activities (e.g., making crafts, watching television, playing Wii games) throughout the day. The room arrangement consisted of six rectangle tables and a television located on the wall. A nurse's clinic, changing room, and transportation office were in conjunction to this room. The kitchen setting of the facility was located between two large rooms with 10-30 clients in each room. There was a large three compartment sink, ice marker, and a four-burner stovetop. Cabinets were located above the sink and below counter tops. Two to three program assistants were located inside of the connecting rooms at any given time. Sessions occurred up to three times each day between the hours of 8:00 a.m. and 4:00 p.m. Monday through Saturday. Sessions varied between times according to each participant's daily schedule. A minimum of one hour elapsed between sessions.

For two participants (Ronnie and Kathy), generalization pretest and posttest took place in their home settings. Each participant had a washing machine and dryer located within their home. All materials (i.e., laundry, laundry baskets, and detergent) were accessible to the participant. The room and machines varied in topography and individualized videos were created for each participant. Ronnie's generalization setting consisted of a General Electric top loader washing machine using liquid detergent and a front loader dryer located in a small laundry room. Kathy's generalization setting took place in a utility room located in her home. This room consisted of a Whirlpool Duet set front loading washing machine using pod detergent and dryer with a dryer sheet.

Materials and Equipment

An iPad was available with a preloaded application called *My Pictures Talk* for each participant. This is an affordable app ($2.99 at the start of the study) created by Grembe, Inc., loaded with individualized task videos made specifically for each participant's needs and developed by the researcher (Spriggs et al., 2015). Each participant's iPad contained a VAS using a picture to depict each task. The target skills for this study were daily living skills that the participants completed at the facility or at home. Table 2 includes the task analysis (TA) of the steps for each task. Necessary materials to complete each task were pre-arranged. This included towels, clothes, laundry baskets, and powder detergent. The washing machine and dryer were both models made by General Electric. The washing machine was a top loading washing machine, and the dryer was front-loading. Stimulus prompts were located on the laundry baskets. Two baskets had "dirty" written along the handles of the laundry basket and another two baskets had "clean" written along the handles of the laundry baskets. Prepared materials for data collection were available to the program manager and researcher before each session. The majority of steps in the laundry TA were filmed in third person point-of-view, which allowed the participant to view the actor complete of each TA. Steps that included small details (e.g., turning the knob to a specific setting) were filmed in first person point-of-view to emphasize the critical stimuli. Videos were filmed by the researcher in the location each task took place and edited using *Movie Maker.* Videos captured the critical skills for the entire task and were no longer than 2 m 30 s. Audio for each step was included in each video.

Generalization consisted of a single pretest probe that occurred prior to baseline conditions, and a single posttest probe following the VAS/VM maintenance sessions. Ronnie and Kathy participated in generalization with pretest/posttest occurring in their home environment. The VM filming took place at the generalization setting using similar materials and equipment needed to complete each task, but found in the home. Models for the generalization tasks were the primary caregivers of the participants.

Response Definitions and Data Collection

The task of doing the laundry including sorting clothes, drying clothes, and washing clothes and were task analyzed into individual steps. Data for task completion during baseline, intervention, and maintenance sessions were collected on the percentage of independently completed steps of each TA (see Tables 2 and 5). Participants were given 3 m to complete all the steps for each individual TA. Steps within the TA were scored as correct if they were initiated within 5 s of the task direction or following completion of another step, topographically accurate, and completed within 3 m. The task steps were not required to be in a set sequential order unless it was critical a step occur before moving to another step for the end product to remain the same (e.g., clothes must be inside the dryer before pressing start). Incorrect responses were scored if the participant did not initiate the step, took longer than 3 m to complete each task, or performed the step topographically different manner in that it altered the end product of the task (e.g., did not pour detergent to fill line).

Experimental Design

This study used a single case multiple probe across participants research design to evaluate the use of VAS/VM on the acquisition of laundry skills for adults with ID in an adult day care facility. Multiple probe designs allow for evaluation of intervention effectiveness by measuring the change in behavior and immediacy of effect across behaviors, settings, or participants using a time-lagged introduction of conditions (Gast & Ledford, 2014). A generalization probe occurred before baseline data began. The generalization probe occurred once and consisted of a similar task in a different environment. Probe baseline data collection occurred for all participants. A minimum of five stable (i.e., a percentage of 25% or below) baseline data points were required for all participants to enter technology training. Technology training began for the first participant when baseline data stabilized for all participants. When participants met mastery criteria for technology training (i.e., 100% navigation steps and 90% task completion steps for three consecutive sessions), VAS/VM condition began for that participant. When participant one entered VAS/VM condition, all other participants were probed for baseline. If baseline data for the remaining participants were stable, the second participant entered technology training. This continued until all participants entered technology training. Maintenance data were collected a minimum of once every 5 days for participants who mastered VAS/VM. When all participants mastered the VAS/VM condition, a generalization probe in a novel environment occurred.

Using visual analysis, a within-condition analysis of data included descriptions of condition length, level, variability, and trend. A between-condition analysis of data included descriptions of level and trend direction changes including immediacy of effect. Visual analysis for instructional decisions including when to introduce technology training and VAS/VM to subsequent participants, or when an instructional modification was needed. VAS/VM demonstrated experimental control by increasing levels and trends, only after the introduction of VAS/VM while maintaining baseline levels and trends prior to VAS/VM (Gast & Ledford, 2014).

General Procedures

Sessions were conducted a minimum of three days per week with no more than three sessions per day. No sessions occurred back to back; they occurred separately with a minimum of 1 hour between sessions. The researcher began each session by stating, "It's time to work." The researcher waited for an attending response (e.g., eye contact, "okay") then provided the task direction "check your <task> schedule" (e.g., "Check your laundry schedule"). The iPad was available on the dryer to the participants as the researcher stated "Check your <task> schedule." The participants were given 5 s to initiate the task. Arranged materials were present in the natural environment (e.g., the detergent was in the cabinet above the washing machine). Correct responses received general praise (e.g., "Excellent") on a minimum of VR3 schedule.

Generalization

The purpose of the generalization sessions was to assess participants' use of VAS/VM presented in a novel VM and in each participant's home setting. Generalization consisted of a pretest/posttest probe that followed general procedures. The pretest probe occurred prior to initial baseline and technology training conditions. The pretest/posttest probe used the same video in both probe sessions and took place in the same environment. The participants were given the task direction and handed an iPad preloaded with a VAS/VM of the laundry task specific to their home setting. A generalization post-test using the VAS/VM occurred after all participants met mastery criteria (described below) in the VAS/VM conditions.

Baseline

Baseline sessions occurred in the laundry area of the adult day care facility and followed general procedures. A multiple opportunity probe assessed all steps of the TA during the first baseline session for all participants. Baseline data were collected on the number of correct steps completed in each TA. During the multiple opportunity probe (MOP), if a participant independently completed a step in the sequence, general praise was provided, and the participant moved on to the next step in the task sequence. If a participant engaged in an error, the researcher blocked his or her vision from the task, then the researcher completed the step. The researcher then unblocked their view and provided an indirect verbal prompt (e.g., "Keep going"). This procedure was repeated for the remainder of the steps in the TA. Following the first baseline session, single opportunity probes assessed the remaining baseline sessions. During single opportunity probes, the session ended when a participant engaged in a critical error (i.e., error that altered the end product of the task) or at the end of the TA. If the session ended due to an error, the researcher said, “Thanks for trying.” Baseline continued until probe data stabilized for a minimum of five sessions for all participants. Baseline data for subsequent tier participants not in technology training or VAS/VM conditions were collected a minimum of every five sessions, as well as the session before a participant entered technology training.

Technology Training

When baseline data stabilized for all participants, participant one entered technology training. Technology training taught the participants how to navigate the VAS/VM on the iPad (see Table 3). The participants had access to an iPad set to the home screen and locked, located on the dryer in the laundry area. The tasks preloaded into the VAS/VM were ones in which the participant had already mastered (i.e., sorting utensils, putting away clean drinking pitchers, bringing dirty dishes to the kitchen sink; see Table 4). The researcher gave the task direction “check your kitchen schedule” and the participant was expected to get the iPad from the laundry room and begin navigation steps (e.g., push the home button, slide to unlock, press the *My Pictures Talk* application, select ‘Kitchen’ on iPad). After watching the video, the participant completed the task then resumed navigation steps (e.g., after putting the cups on the sink, the participant pushed the green arrow on the iPad). This continued until all navigation steps were completed.

The participants were given 5 s to initiate the first step in the task once the video finished, remaining steps were given 30 s for completion. If the participant did not initiate the task within 5 s or complete the task within 30 s, the researcher used a system of least prompts (verbal, gesture, full physical) to teach the step. A system of least prompts provides the least intrusive prompt when teaching a task. The prompt hierarchy consisted of an independent response, where the participant completed each step without any prompting. A verbal prompt, where the researcher stated the correct step of the TA, a gestural prompt where the researcher pointed with a finger to the next step of the TA, and a full physical prompt where researcher used hand-over-hand to physically guide the participant through the step. If the participant did not initiate a step within 5 s or complete a step within 30 s, a verbal prompt was delivered. This continued through all prompts in the hierarchy until the participant completed each step. When participants mastered the TA for all known tasks with 100% independent correct on navigation steps and 90% or higher independent correct responses on training tasks for three consecutive sessions they entered intervention using VAS/VM.

Visual Activity Schedules with Embedded Video Models

The independent variable in this study was the use of VAS with embedded VM. VAS/VM condition followed general and baseline procedures. In the VAS/VM condition, the participants navigated an iPad with a preloaded *My Pictures Talk* application that provided VAS/VM showing a video of how to complete the laundry tasks. The tasks were novel laundry tasks: (a) gathering and sorting clothes and towels into two piles, (b), drying previously washed clothes, and (c) washing dirty clothes (see Table 2). Intervention began for each participant after mastery of technology training. Participants were involved in regular scheduled activities (e.g., crafts, Wii games, board games). Mastery criteria included participants completing the TA for laundry with a 90% or higher accuracy for three consecutive sessions.

Reliability

IOA data for task completion were collected for a minimum of 20% of all sessions across all conditions and participants. The researcher and reliability data collector had a minimum of 80% agreement using the point-by-point method (number of agreements divided by number of agreements plus nonagreements; Gast & Ledford, 2014). PF data were collected simultaneously with IOA data and ensured all procedures across conditions were implemented as planned. PF data were collected on the number of correctly implemented procedure steps divided by the total number of steps (Gast & Ledford, 2014). Each session maintained a minimum of 90% PF data. If IOA dropped below 80% or PF dropped below 90%, retraining sessions occurred for the data collectors. IOA and PF for Ronnie were collected 21.9% of sessions. IOA was 98.0% and PF was 99.1%. IOA and PF were collected 22.6% of all sessions for Kathy, in which IOA was 99.3% and PF was 99.2%. IOA and PF were collected 21.4% of Dean's sessions. IOA was 98.6% and PF was 100%. IOA and PF were collected 20.5% of Anna's sessions. IOA was 99.4% and PF was 98.8% across sessions.

Section 3: Results

All participants maintained stable baseline data within the baseline condition with a percentage of 25% or below. An accelerating trend occurred among all four participants for total task completion and navigation during technology training. Three participants mastered the VAS/VM condition. When participants mastered the VAS/VM condition, a posttest assessed generalization of similar tasks in different environments in the home for two of the participants. An increase in the percentage of independently completed steps of the TA in the generalization post-test occurred. The posttest results provide evidence that the VAS/VM once mastered, can be an effective procedure to teach similar skills across environments.

Ronnie

Ronnie independently completed one step in all sessions of baseline (i.e., open the washing machine lid). After five sessions of stable baseline responding at 5%, technology training was introduced. During technology training, Ronnie reached mastery criteria for task completion in a total of 14 sessions. Navigation responding increased during technology training with a steady accelerating trend. During technology training, it became clear that Ronnie did not possess the necessary fine motor skills to navigate the iPad. Specifically, without the use of the physical prompt in the system of least prompts hierarchy, Ronnie could not independently use a single pointer finger to navigate the touchscreen technology. Ronnie navigated the technology according to each step in the TA, however when he touched the iPad he used his thumb, index finger, and middle finger simultaneously to push icons or applications. Technology training was paused for

5 days at session 12. During this time, the researcher-downloaded games onto the iPad to teach him to navigate the iPad using a single index finger. Graduated guidance procedures were used to teach the isolated skill of navigating the technology using a single index finger. A hand-over-hand physical prompt served as the controlling prompt and was faded as correct responding increased. Technology training continued once the target skill of using an index finger to navigate the iPad improved. His range of performance navigating the technology increased from 30% to 100%. The navigation component of the technology training condition increased with a slow accelerating trend. An increase in level for both navigation and task completion occurred within the technology training condition. Technology training reached mastery criteria after 60 sessions. Ronnie met mastery criteria in six sessions of the VAS/VM condition. Between baseline and VAS/VM a significant increase in level occurred with a therapeutic trend to mastery criteria. Maintenance probes conducted every five sessions remained stable, with 100% task completion for laundry tasks.

Prior to baseline sessions, a generalization pretest occurred in Ronnie's home. Ronnie's pretest indicated he completed 10% of the total steps of the laundry task (i.e., opening the washing machine lid, closing the washing machine lid). Ronnie's posttest increased significantly to 84% independent steps completed correctly. Ronnie did not correctly complete the step to move the dial to the proper setting to begin the washing machine and did not rinse the detergent cup (see Table 5). Ronnie's top loader washing machine had a different dial than the day care facility washing machine. In the VAS/VM condition that took place at the day care, powder detergent was used to wash laundry.

This differed from the generalization posttest. Liquid detergent was used with an added step to rinse detergent cup after pouring into the wash bin.

Kathy

Kathy began the first two baseline sessions completing 10% of the total task. In session three, there was an increase to 25% of the total task being completed. Baseline continued and stabilized at 25% task completion for 4 consecutive sessions. Kathy began technology training in session 15. Navigation responding increased rapidly during technology training with a therapeutic trend. Kathy reached mastery criteria for technology training in 22 sessions, with three consecutive sessions with 100% task completion and navigation. Kathy began VAS/VM with baseline level responding for 3 consecutive sessions, followed by a variable therapeutic trend. Kathy mastered the VAS/VM condition in nine sessions, with 3 consecutive days at 100% task completion for laundry tasks. Maintenance probes every five sessions remained at 100% laundry task completion.

Prior to baseline sessions, a generalization pretest occurred in Kathy's home. The pretest indicated Kathy completed 20% of the laundry task (i.e., open washing machine door, put wet laundry into a basket, move laundry basket in front of the dryer, put wet laundry into the dryer, move basket in front of the washing machine). Kathy's posttest increased significantly to 88% independent laundry task completion. Kathy did not complete the final two steps (i.e., push the Water Temp button, push Start button). The day care facility washing machine differed from Kathy's generalization setting in regards to steps to turn on the machine. The day care facility washing machine required one step (i.e., push Start) to turn on the machine. Kathy's generalization setting required four steps to start the machine (i.e., turn dial to Whitest Whites, push the Power button, push the Water Temp button, push Start).

Dean

When Kathy reached mastery criteria for technology training and began VAS/VM, Dean began technology training. During the MOP in session one Dean completed 20% of the laundry task. The following baseline sessions Dean completed 10% of the steps correctly for the laundry tasks (i.e., open the washing machine lid and open the dryer door). Dean began technology training in session 38 and correctly completed 30% of the navigation steps. An accelerating trend increasing from 30% to 84% occurred during technology training. In session 57 the participant's occupational therapist implemented the use of a walker by Dean at all times. The occupational therapist was concerned about Dean's gait, as there was an increased risk of Dean falling at home, some of which caused injuries in the past. Dean had no history of falling at the day care facility. The researcher secured permission from the participant's guardian and the director of the adult day care facility to continue the research study allowing Dean to participate without the use of a walker to complete the task with the researcher within 5 ft. proximity. Dean increased in responding to 84% with an accelerating trend. In session 69, Dean was withdrawn from the study due to a recommendation from the occupational therapist regarding a concern for his safety.

Anna

Anna began baseline sessions with variable responding for task completion between 20 to 25%. Baseline data stabilized at or below 25% laundry task completion. Anna began technology training when Dean was withdrawn from the study. Beginning technology training, Anna responded with 53% independent technology navigation and 73% task completion. A rapid accelerating trend occurred until Anna reached mastery criteria for the technology training condition in 13 sessions. When Anna met mastery criteria for technology training, the VAS/VM condition began. The first four sessions of the VAS/VM condition remained at baseline levels, most likely due to inhibitive effects of testing (i.e., Anna remained in baseline for a total of 17 sessions and in session 68 a decrease in baseline from 25% to 10% occurred). Beginning the VAS/VM condition Anna responded at 25% for 4 sessions. In session five, Anna responded with an abrupt increase in level to 95%. Anna mastered the VAS/VM condition in nine sessions of VAS/VM condition. Maintenance probes assessed for 5 sessions ensured Anna maintained the skill of doing laundry. All probes maintained at 100%.

Section 4: Discussion

The purpose of the current study was to evaluate the use of VAS with embedded VM to increase independence in laundry skills for adults with ID. Results from the current study provide evidence that a functional relation exists for using VAS/VM to teach laundry skills to adults with ID. Adults with ID receive various supports from parents/guardians, therapists, medical doctors, and other professionals to acquire and maintain skills. Acquiring daily living skills can increase independence and decrease the amount of support needed from their caregivers. VAS used in combination with VM allows an individual to view the sequential order of steps to complete a task and ensures a consistent model of the target task. Mobile devices (e.g., iPads, tablets, smart phones) are readily available and socially appropriate for a variety of settings. Applications can be downloaded on to a device and used as VAS/VM.

The purpose of this study was to demonstrate the use of VAS with embedded VM and increased independence in laundry skills in three adults with ID. Two participants generalized the use of the VAS/VM to similar tasks in novel settings. Spriggs et al. (2015) demonstrated that VAS/VM was an effective instructional method for teaching adolescents with ASD and ID to self-instruct and complete tasks independently using VM and VAS in combination. Results from Spriggs et al. and the current study provide evidence that VAS/VM is an effective instructional method for adults with ID and students with ASD and ID. These findings also provide evidence that adults, when trained to navigate the technology, could use the VAS/VM to learn a series of new tasks without instructor or caregiver support.

Limitations

A few limitations related to implementation of the dependent variable in the day care setting should be noted. Specifically, PF data were not collected until the fourth session of baseline. Since two different probe procedures were conducted in baseline, PF also should have occurred during the initial MOP. During the second baseline session for all participants, the iPad was not available.

An additional limitation to this study was during all sessions, materials were pre-arranged. On multiple occasions, staff or members of the day program removed or manipulated the materials. A discriminative stimulus was added (i.e., a blue star) to alert staff members a session was in progress and materials should remain arranged. In the kitchen area, the kitchen manager agreed to leave the pre-arranged materials in the arrangement until after the session was completed. When the discriminative stimulus was implemented an increase in PF occurred. Specifically, the materials being pre-arranged and available.

An additional limitation was during the pre/posttest the participants were given the iPad. This differed from training procedures which consisted of the iPad being available on the dryer. In training, the participant initiated the task by getting the iPad from the dryer. In the generalization pre/posttest the researcher initiated the task by providing the iPad to the participants.

Another limitation to this study is the lack of pre-screening for fine motor movements and navigation of the iPad. If a screening for fine motor movements had occurred, Ronnie would not have met the inclusion criteria for the study. Ronnie did not have the fine motor movements necessary to navigate the technology on the iPad. He had long fingernails, which prohibited him to navigate the technology independently. Ronnie also had mild Cerebral Palsy, which restricted fine motor movements in both hands. A screening for fine motor movements would indicate a skill deficit allowing the researcher to teach the necessary required skills (e.g., isolating a single finger, activating the iPad), add an additional form of assistive technology (e.g., stylus), or not include the participant in the intervention. Due to time constraints of the researcher's master's thesis, Kathy began technology training while Ronnie was still in technology training.

Future Research

There is limited research that focuses on the adults with ID. This population requires numerous financial supports along with support from caregivers. These caregivers are often the only support these individuals receive which cause stress on both parties. As caregivers age, it can become more difficult to care for these adults. When a caregiver can no longer care for the individual they are often placed in a facility such as residential services or nursing homes. Independence, including completing daily living skills, can prolong this process by decreasing the amount of stress placed on caregivers. Future research should focus on adults with ID and teaching daily living skills to increase independence.

A need for future research teaching daily living skills in both children and adults exists. Completing the task of doing the laundry allows an individual to contribute to their environment. Examples including self-care, cooking, cleaning, transportation (e.g., riding the bus), and employment should be researched to teach this population of individuals. Instructing these skills can teach independence and increase the quality of life for adults with ID.

Appendix A: Laundry TA

Table 1. Laundry TA

Drying Clothes	
1.	Open dryer door
2.	Open washing machine door
3.	Take laundry out of washing machine
4.	Put them in the dryer
5.	Close dryer door
6.	Turn timed dry to heavy duty
Sorting Clothes	
1.	Collect dirty laundry bin from bathroom
2.	Collect dirty laundry bin from kitchen
3.	Empty bins into a pile on the floor
4.	Place towels in a dirty bin
5.	Place clothes in a dirty bin
6.	Bring dirty bins to the washing machine
Washing Clothes	
1.	*Open washing machine lid
2.	Put dirty clothes from dirty bin into the washing machine
3.	Get scoop for powder detergent
4.	Fill scoop with powder
5.	Pour detergent into the washing machine on top of clothes
6.	Put scoop back into box

7. *Close washing machine lid

8. *Push start

Appendix B: Screening

Table 2. Screening

Washing Hands
1. Turn on water
2. Get Soap
3. Scrub hands together*
4. Rinse hands
5. Turn off water
6. Get paper towel
7. Dry hands
8. Throw towel away*
Sorting Cones
1. Take the cones apart
2. Blue Cone
3. Green Cone
4. Red Cone
Pouring a Drink
1. Lift drink pitcher
2. Pour drink into cup
3. Fill up the cup
4. Put materials back on the table

Appendix C: Steps for Navigating the VAS/VM

Table 3. Steps for navigating the VAS/VM

1. Turn on iPad
2. Slide curser to right
3. Select the MyPics application on the iPad
4. Select the picture with the task schedule (this will take students to their VAS)
5. Select the 1st picture at the top of the screen
6. Tap the picture
7. Tap the green arrow on the right OR swipe left
8. Tap the blue arrow (this will show students to the video model of the first task)
9. Watch the video
10. When the steps of the first task have been completed, tap the green arrow on the right
11. Tap the picture between the arrows
12. Tap the green arrow on the right OR swipe left
13. Tap the blue arrow (this will show students to the video model of the second task)
14. Watch the video
15. When the steps of the second task have been completed, tap the green arrow on the right
16. Tap the picture between the arrows
17. Tap the green arrow on the right OR swipe left

18. Tap the blue arrow (this will show students to the video model of the third task)

19. Watch the video

(Spriggs et al. 2015)

Appendix D: Technology Training

Table 4. Technology Training

1. Get iPad from Laundry Room
2. *Push the home button
3. *Slide to unlock
4. *Press MyPics App
5. *Press the 'Kitchen' on iPad
6. *Press the 1st picture at the top on iPad
7. *Press the picture on iPad
8. *Watch the video
9. Pick up dirty cups
10. Walk to the kitchen
11. Put cups on the sink
12. *Press green arrow on iPad
13. *Push the picture
14. *Watch the video for putting away clean dishes
15. Get clean pitchers from the sink
16. Open cabinet door
17. Put pitchers into the cabinet
18. Close Cabinet Door
19. *Press the green arrow on iPad
20. *Push the picture
21. *Watch 3rd video Sorting utensils

22. Gather clean utensils

23. Open drawer

24. Sort forks

25. Sort spoons

26. Sort knives

27. Close drawer

28. Put bowl on the sink

---

*Technology Steps

Appendix E: Participant 1 Pre/Post Test

Table 5 Participant 1 Pre/Post Test

Drying Laundry	
1.	Go to the laundry room
2.	Open dryer door
3.	Open washing machine door
4.	Take laundry out of washing machine
5.	Put Landry in the dryer
6.	*Close dryer door
7.	*Turn the dial to the top setting
8.	*Push start

Washing Laundry	
1.	Turn dial to Extra Wash On
2.	Open Washing machine
3.	Get detergent
4.	Open detergent
5.	Pour detergent into the cup to fill line
6.	Empty cup into the washing machine
7.	Rinse the cup with water
8.	Put the top onto the detergent
9.	Put the detergent away
10.	Put dirty laundry into the washing machine
11.	Close the washing machine lid

Appendix F: Participant 2 Pre/Post Test

Table 6. Participant 2 Pre/Post Test

Drying Laundry
1. Open washing machine door
2. Put wet laundry into a basket
3. Move laundry basket in front of the dryer
4. Put wet laundry into the dryer
5. Move basket in front of the washing machine
6. Open the drawer under the dryer
7. Get 1 dryer sheet
8. Close the drawer
9. Put the dryer sheet into the dryer
10. Close dryer door
11. Push Power button
12. Push Start button
Washing Laundry
1. Put dirty clothes into a basket
2. Put dirty towels into another basket
3. Bring dirty towel basket to the washing machine
4. Put dirty towels into the washing machine
5. Open drawer under the dryer
6. Get a Tide Pod
7. Clothes the drawer

8. Put the Tide Pod into the washing machine
9. Close washing machine door
10. Turn dial to Whitest Whites
11. Push the Power button
12. Push the Water Temp button
13. Push Start

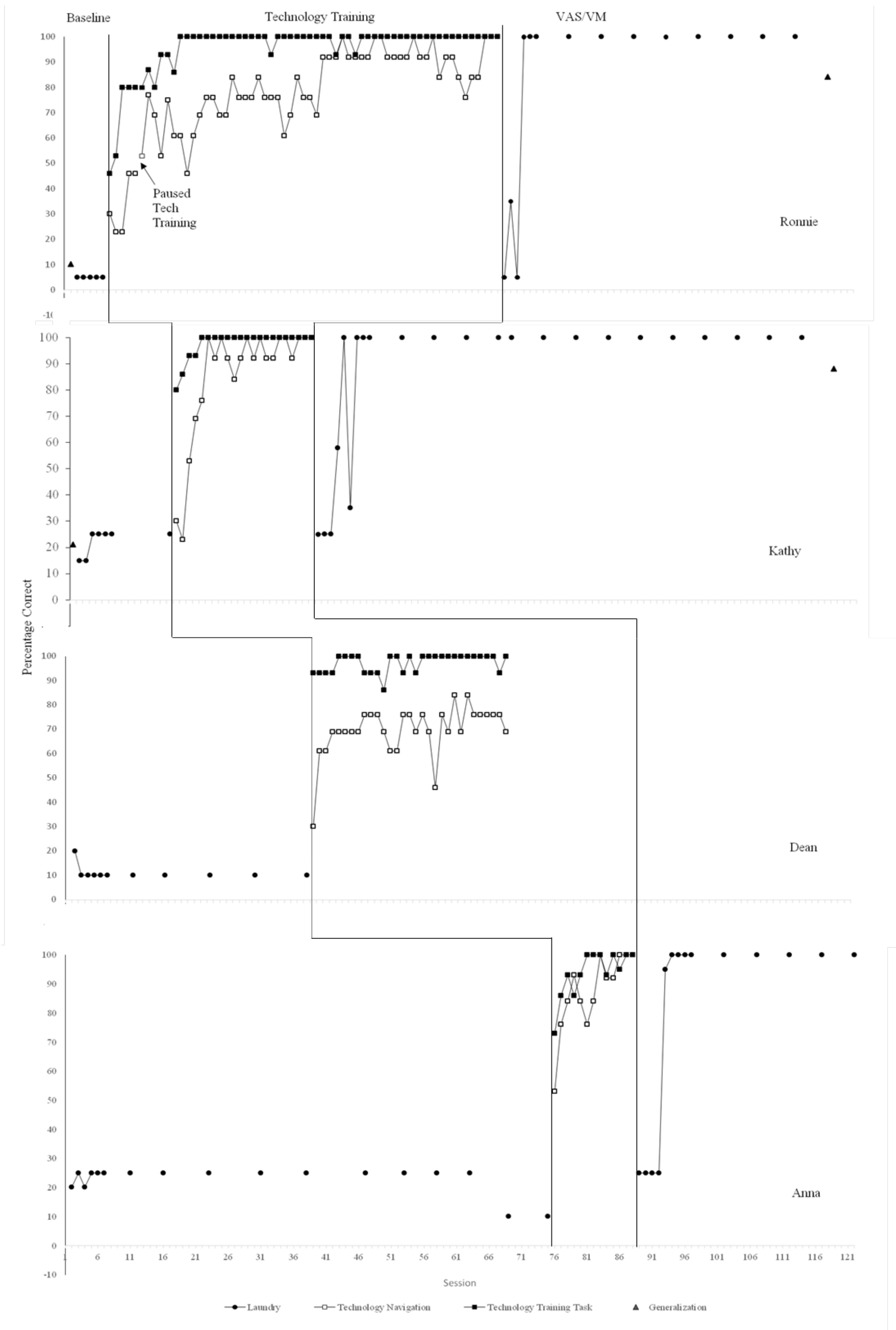

Figure 1: Graph of Results

References

Banda, D. R., & Grimmet, E. (2008). Enhancing social and transition behaviors of persons with autism through activity schedules: A review. *Education and Training in Developmental Disabilities*, 43(3), 324-333.

Bellini, S. & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children, 73,* 261–284.

Bereznak, S., Ayers, K. M., Mechling, L. C., & Alexander, J. L. (2012). Video self-prompting and mobile technology to increase daily living and vocational independence for students with autism spectrum disorders. *Journal of Developmental and Physical Disabilities, 24,* 269–285. doi:10.1007/s10882-012-9270-8

Bryan, L. C. & Gast, D. L. (2000). Teaching on-task and on-schedule behaviors to high-functioning children with autism via picture activity schedules. *Journal of Autism and Developmental Disorders, 30*, 553–567.

Chan, J., Lambdin, L., Graham, K., Fragale, C., & Davis, T. (2014). A picture-based activity schedule intervention to teach adults with mild intellectual disability to use an iPad during a leisure activity. *Journal of Behavioral Education*, *23*, 247-257. doi:10.1007/s10864-014-9194-8

Chan, J., Sigafoos, J., Watego, N., & Potter, G. (2001). Adults with intellectual disability in long-term respite care: a qualitative study. *Journal of Intellectual & Developmental Disability*, *26*(4), 339-344.

Duttlinger, C., Ayres, K., Bevill-Davis, A., & Douglas, K. H. (2012). The effects of a picture activity schedule for students with intellectual disability to complete a sequence of tasks following verbal directions. *Focus on Autism and Other Developmental Disabilities*, 28(1), 32-43.

Gardener, S. J. & Wolfe, P. S. (2014). Teaching students with development disabilities daily living skills using point of view modeling plus video prompting with error correction. *Focus on Autism and Other Developmental Disabilities*, 30, 195-207. doi:10.1177/108835761454781

Gast, D. L. & Ledford, J. R. (2014). Single case research methodology: Applications in special education and behavioral sciences (2nd ed.). New York, NY: Routledge.

Hume, K., Loftin, R., & Lantz, J. (2009). Increasing independence in autism spectrum disorders: A review of three focused interventions. *Journal of Autism and Developmental Disorders, 39,* 1329–1338.

Landesman, S. & Butterfield, E. C. (1987). Normalization and deinstitutionalization of mentally retarded individuals: Controversy and facts. *American Psychologist*, 42, 809-816

Mechling, L. C. (2005). The effect of instructor- created video programs to teach students with disabilities: A literature review. *Journal of Special Education Technology*, 20, 25-36.

Mechling, L. C., K. M. Ayres, K. J. Bryant, & A. L. Foster. (2014). Continuous video modeling to assist with completion of multi-step home living tasks by young adults with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 49*, 368-380

Mechling, L. & Collins, T. (2012). Comparison of the effects of video models with and without verbal cueing on task completion by young adults with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 47*, 223-235.

Smith, K. A., Ayres, K. A., Alexander, J., Ledford, J. R., Shepley, C., & Shepley, S. B. (2015). Initiation and generalization of self-instructional skills in adolescents with autism and intellectual disability. *Journal of Autism and Developmental Disorders, 46*, 1196-1209. doi:10.1007/s10803-015-2654-8

Spriggs, A. D., Knight, V. F., & Sherrow, L. (2015). Talking picture schedules: Embedding video models into visual activity schedules to increase independence for students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *45*, 3846-3861. doi:10.1007/s10803-014-2315-3

Spriggs, A. D., Mims, P. J., van Dijk, W, & Knight, V. F. (in press, on-line first 2016). Examination of the evidence base for using visual activity schedules with students with individuals with intellectual disability. *The Journal of Special Education*. doi:10.1177/0022466916658483

Taber-Doughty, T., Miller, B., Shurr, J., & Wiles, B. (2013). Portable and accessible video modeling: Teaching a series of novel skills within school and community settings. *Education and Training in Autism and Developmental Disabilities, 48,* 147-163.

Vita

Charity G. Watson

Spalding University 2010-2014

Bachelor of Arts in Psychology